

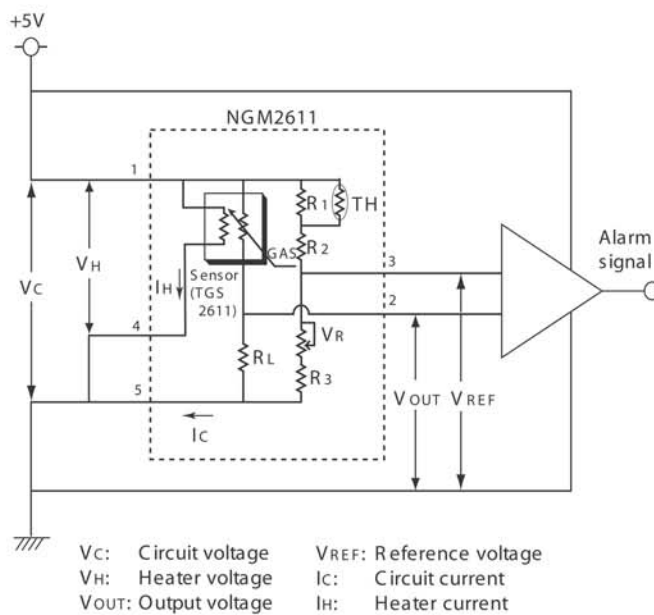
Meets the RoHS regulation

Methane Gas sensor module model NGM2611-D09

The NGM2611-D09 is a pre-calibrated module for Methane gas detectors defined hereunder in the scope.

This module is designed to meet the performance requirements of EN50194, and the RoHS requirements.

Circuit Diagram



Basic Pin Connection

A regulated voltage of 5V DC should be applied to Pin #1. A voltage comparator should be connected to Pins #2 and 3. A circuit for detecting breakage of the heater may be connected to Pin #4 (in which case, Pins #4 and 5 should be connected separately to the GND).

When the gas sensor module is exposed to a concentration of target gas which exceeds the desired alarming point, the value of V_{out} will reach or exceed the value of V_{REF} causing the module to reach the alarm condition.

Parts List:

Symbol	Part	Spec.	Maker	Model #	Qty
R 1	Carbon resistor	22kΩ 1/8W	Panasonic	ERJ8GEYJ223A	1
R 2	Carbon resistor	6.8kΩ 1/8W	Panasonic	ERJ8GEYJ682A	1
R 3	Carbon resistor	6.8kΩ 1/8W	Panasonic	ERJ8GEYJ682A	1
RL	Carbon resistor	Var. 1/8W	Panasonic	ERJ8GEYJxxxA	1
VR	Potentiometer	20kΩ 1/3W	HDK	NVG6	1
	(alternative)	20kΩ 1/3W	Koa	KVSF689A	
TH	Thermistor	10kΩ at 25°C B const.=3400+/-3%	Mitsubishi Materials	SC20-3I103KT	1
	(alternative 1)	10kΩ at 25°C B const.=3370+/-1%	Mitsubishi Materials	TH11-3H103FT	
	(alternative 2)	10kΩ at 25°C B const.=3414+/-1%	Semitec	103K1608T-1P	
	(alternative 3)	10kΩ at 25°C B const.=3380+/-1%	Murata	NCP18XH103J03RB	
Sensor	Gas Sensor	-	Figaro	TGS2611-D00	1
CN	Connector	-	Nichiatsu	MB5P-90S	1

Specifications:

Module number		NGM 2611-D09	
Standard test conditions	Test gas conditions	3400±100ppm methane in air at 20±2°C, 50±5% RH	
	Circuit conditions	V _H = 5.0±0.05V DC V _C = 5.0±0.05V DC	
	Preheating period prior to test	2 days	
Electrical characteristics under standard test conditions	Reference voltage	V _{REF(STD)}	1.4 to 3.0V DC
	Output voltage	V _{OUT(STD)}	1.4 to 3.0V DC

Electrical Characteristics:

Recommended operating conditions	Heater voltage	V _H	5.0±0.2V DC
	Circuit voltage	V _C	5.0±0.2V DC
	Minimum impedance between Pin#2 and GND	2.5MΩ	
	Minimum impedance between Pin#3 and GND		
	Operating conditions	0~40°C, 30~95%RH	
Temperature differential between inside and outside detector casing	10°C (see NOTE 1)		
Electrical characteristics under operating conditions	Heater current (current between Pins #1 and 4)	I _H	56±5mA
	Circuit current (current between Pins #1 and 5)	I _C	10mA (max.)
	Reference voltage	V _{REF}	0.8 ~ 3.5 V DC (see NOTE 2)
	Output voltage 0~20,000ppm methane in air	V _{out}	0.05 ~4.0V DC (see NOTE 3)

NOTE 1: This value is on the responsibility of manufacturer of gas detectors. If the actual temperature difference is different from 10 degree C, actual alarm concentration would drift.

NOTE 2 and 3:

Reference voltage may be out of the range in case of lower or higher temperature than operating conditions.

Output voltage may be out of the range in the following situation:

* Methane concentration is more than 20,000ppm .

* During warm-up period called 'Initial action'. (see 2-6 Initial action in page 7 of technical information for TGS2611)

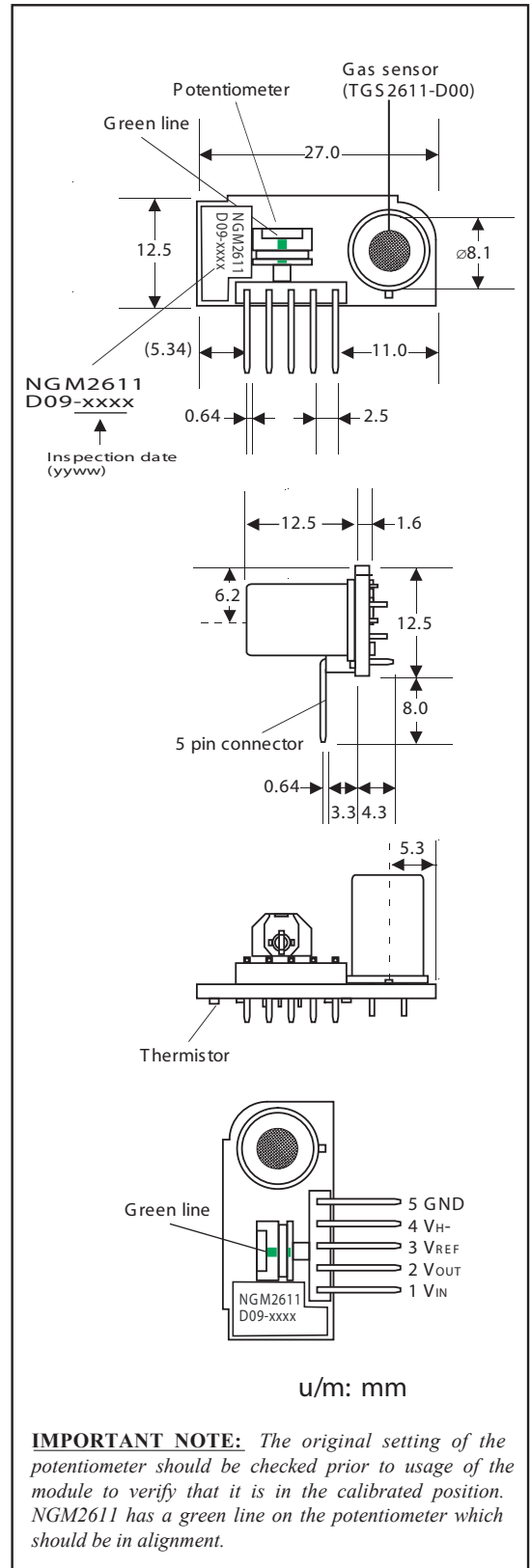
ACCORDINGLY, WE STRONGLY RECOMMEND TO SET A MALFUNCTION THRESHOLD BY REFERRING THE FOLLOWINGS:

Recommendable threshold for malfunction:

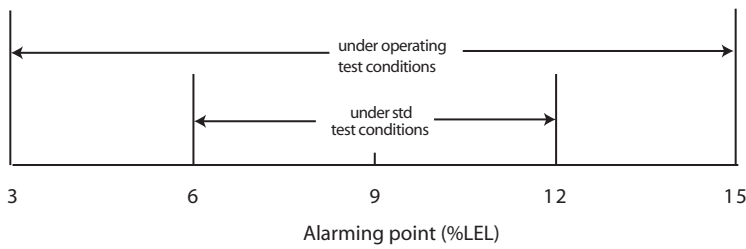
V_{ref}: Lower than 1.0V DC, Higher than 4.0V DC

V_{out}: Lower than 0.05 DC, Higher than (V_C - 0.05)V DC

Structure and Dimensions:



Expected performance:



Expected performance of the Vimar methane gas detector using NGM2611-D09

NOTE: When using NGM2611-D09, typical alarm tolerances for 9%LEL of methane gas such as those shown in the figure above can be expected. However, in actual usage, alarm thresholds may vary since the threshold is also affected by such factors as the tolerances of test conditions and heat generation inside the gas detection enclosure. As a result, Figaro neither expressly nor impliedly warrants the performance shown in this figure. If a large difference between the expected and actual performance of detectors is noticed, please consult with Figaro.

Absolute Maximum Ratings:

Absolute maximum ratings (see NOTE)	Circuit voltage	V _c	-0.3~+6.0V DC
	Heater voltage	V _H	-0.3~+5.5V DC (max. of 2 minutes at 5.5V)
	Operating temperature		-15~+55°C (max. 95%RH)
	Storage temperature		-20~+60°C (avoid condensation)
	Soldering temperature		260°C (max. in 10 sec.)

NOTE: Detectors should be designed according to "Recommended Operating Conditions" as shown above. However, detector circuits should also be designed not to exceed "Absolute Maximum Ratings" under any circumstances. To exceed these ratings may cause damage or deterioration of the sensor.

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